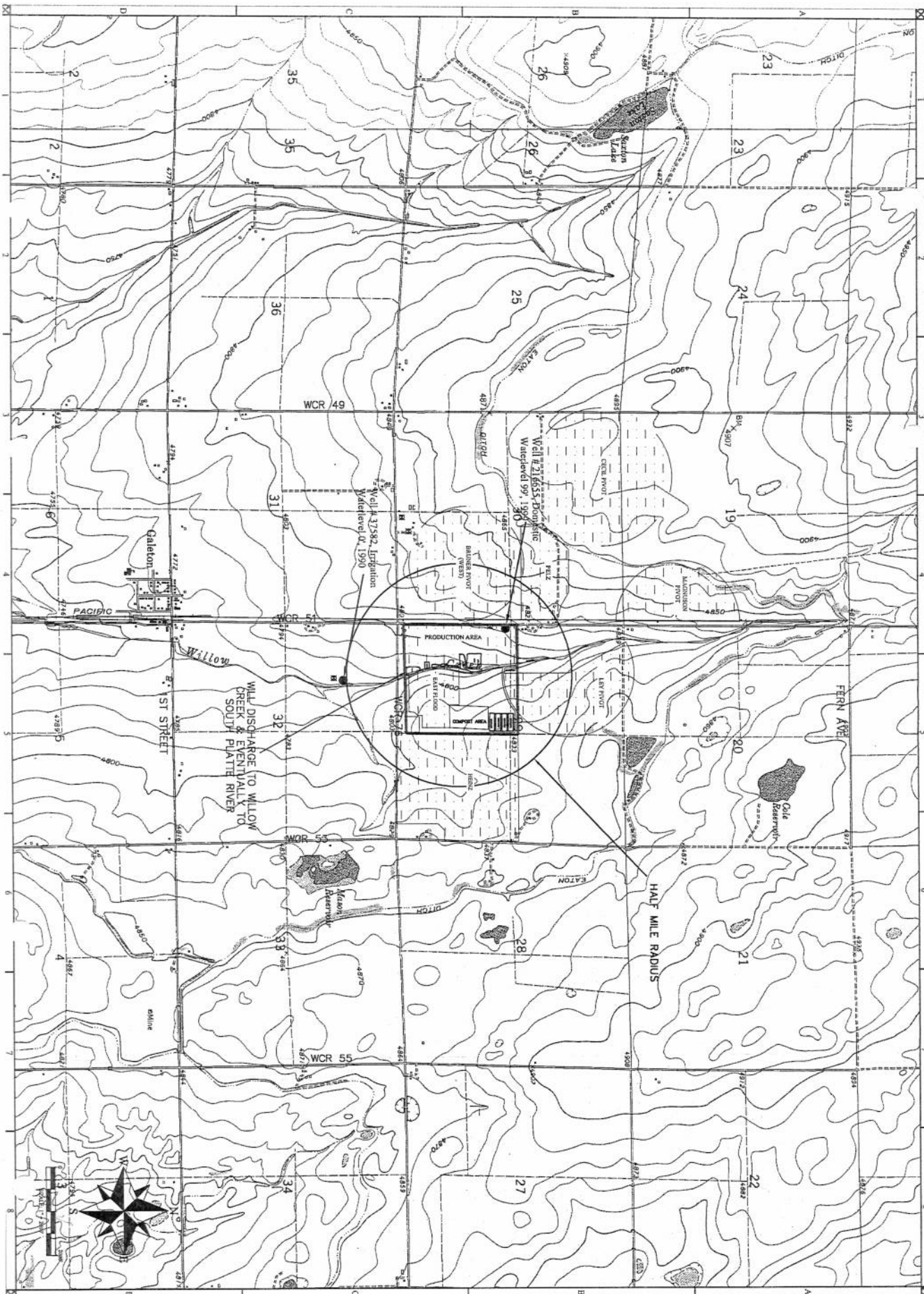


APPENDIX A

NUTRIENT MANAGEMENT PLAN TERMS (1 – 6)

1) LAND APPLICATION FIELD MAPS



GALETON DAIRY ATTACHMENT A

PART OF THE SOUTHEAST 1/4, OF SECTION 26, TOWNSHIP 07N, RANGE 64W OF THE
6TH P.M., COUNTY OF WELD, STATE OF COLORADO.



4350 Highway 66, Longmont, CO 80504
(970) 535-9318 • fax: (970) 535-9854

DATE	BY	REVISION
01/11/11	AG	INITIAL DESIGN
02/01/11	AG	REVISED DESIGN
03/01/11	AG	FINAL DESIGN
04/01/11	AG	CONSTRUCTION
05/01/11	AG	AS BUILT
06/01/11	AG	FINAL AS BUILT
07/01/11	AG	FINAL AS BUILT
08/01/11	AG	FINAL AS BUILT
09/01/11	AG	FINAL AS BUILT
10/01/11	AG	FINAL AS BUILT
11/01/11	AG	FINAL AS BUILT
12/01/11	AG	FINAL AS BUILT

A

SHEET:

1 OF 2

GALETON

CAD

APPENDIX B

NUTRIENT MANAGEMENT PLAN TERMS

2) LAND APPLICATION INFORMATION

All land application fields are listed below.

[illegible]³Field acreages reduced by any setbacks, buffers, or otherwise unspreadable areas.

NMP TERMS - 2) LAND APPLICATION CROPS

Potential crops or other uses for each land application field are listed below. Crops in the 5 year rotation are listed per field. Additional crops that might possibly be grown on the operation are listed as field "all".

Table –B-1 – Potential Land Application Field Crops

Field Identification	Crop	Realistic Yield Goal	Yield Unit (bushels, tons, etc.)	Source (see Appendix C)
Ley, Bruner, Flood, Magnuson, Cecil, Pelz, Heinz	Corn silage	26.2	Tons	County Stats
Ley, Bruner, Magnuson, Cecil, Pelz, Heinz	Alfalfa	5.3	Tons	County Stats
All	Corn Grain	201.4	Bu	County Stats
All	Sorghum silage	22	Tons	CSU FS
All	Sorghum grain	65	Bu	CSU FS
All	Sudex silage	11	Tons	CSU FS
All	Sudex hay	5.5	Tons	CSU FS
All	Triticale silage	12	Tons	County Stats, Calc
All	Triticale hay	5	Tons	County Stats, Calc
All	Wheat silage	12	Tons	County Stats, Calc
All	Wheat hay	5	Tons	County Stats, Calc
All	Winter wheat grain	71	Bu	County Stats
All	Spring wheat grain	62	Bu	County Stats
All	Oat silage	14	Tons	County Stats, Calc
All	Oat hay	5.2	Tons	County Stats, Calc
All	Oat grain	91	Bu	County Stats
All	Pasture/grass/hay	4.7	Tons	County Stats
All	Sugar Beets	30.1	Tons	County Stats
All	Millet	35	Bu	State Stats
All	Sunflower	1348	Lbs	County Stats
All	Dry Beans	2255	Lbs	County Stats

APPENDIX C

NUTRIENT MANAGEMENT PLAN TERMS

3) EXPECTED CROP YIELD INFORMATION

Yield goals are based upon a variety of sources and are indicated in Table B-2:

Field: an average of the last 5 years of suitable data, plus 10%. Years where yields were affected by drought, hail, insufficient nutrient availability or water, or other problems which would cause unnatural yield loss will not be included.

Farm: where a 5 year average does not exist but data from surrounding fields which are of similar productivity do exist, these yields will be included in the 5 year average. This is also the case where a whole farm yield is monitored rather than yields on individual fields. Where data on individual fields is kept but yield is similar across the farm, the data may be pooled together for simplicity.

Where a 5 year average has not been determined, one of several methods for determining yield goal, depending upon the availability of information, will be used.

- County or State Stats - Ag statistics for the county and crop – 5 years of data + 10%
- AGPRO - data from nearby farms, 5 years + 10%
- CES-FS - Cooperative Extension bulletin 568A or a production publication plus 10%

Calc: calculations will be used if a grain yield goal is known but not a forage yield goal for the same crop, based upon the following data:

Olsen Lab – “Guidelines for Fertilizer Recommendations, Plant Tissue Analysis, and Water Analysis”
(available at their website www.olsenlab.com)

Oat hay yield goal (t/a) x 17.5 = grain yield goal (bu/a)

Forage sorghum yield goal (t/a) x 20 = grain yield

Sorghum silage yield goal (t/a) x 6 = grain yield

Servi-Tech Lab (Crop File 1.02.022 attached)

Corn silage yield goal (t/a) x 7.5 = grain yield, although this will vary with moisture and quality.

Small grain hay (t/a) x 14 = grain yield

Small grain silage (t/a) x 6 = grain yield

Triticale yields will be based upon potential wheat yield if Triticale yields are not known (KSU fact sheet MF-2227)

APPENDIX D

NUTRIENT MANAGEMENT PLAN TERMS

4) NUTRIENT BUDGET INFORMATION

Formulas are provided using recommendations from Cooperative Extension offices from Colorado and surrounding states, Olsen Lab, Servi-Tech Lab, and Midwest Lab. Any one of these formulas might be used to make a recommendation for a given crop in a single year, but two different formulas will not be used at the same time to make in season adjustments for the same crop. All of these laboratories are regionally based. They consider the recommendations from surrounding land grant universities as well as the most current research available. Colorado Cooperative Extension has found Midwest Lab's and ServiTech Lab's recommendations to be comparable to CSU's recommendations (From the Ground Up, Agronomy News, Cooperative Extension, CSU, Vol 24:1, April 2004). Olsen's Lab was not researched. Rather than hand calculating recommendations, the printed results on soil test results from the aforementioned labs might also be used.

4) NUTRIENT BUDGET INFORMATION (yield goals are presented in Appendices B and C)

Cooperative Extension Nutrient Budget Information:

Crop:	Manure and Process Wastewater Application Rate Calculated Using:	Description of Method to be Used (calculation, look-up table, etc.):
Corn Silage	<input checked="" type="checkbox"/> CSUCE Published Fertilizer Suggestions <input type="checkbox"/> Adjacent State CE-Published Fertilizer Suggestions <input type="checkbox"/> CNMP Method that meets USDA-NRCS standards <input type="checkbox"/> CO NRCS NMP guidelines <input type="checkbox"/> Department-approved Method	$35 + (7.5 * YG \text{ (tons/a)})$ Tables 7A-8 CSU Bulletin #568A
Corn Grain	<input checked="" type="checkbox"/> CSUCE Published Fertilizer Suggestions <input type="checkbox"/> Adjacent State CE-Published Fertilizer Suggestions <input type="checkbox"/> CNMP Method that meets USDA-NRCS standards <input type="checkbox"/> CO NRCS NMP guidelines <input type="checkbox"/> Department-approved Method	$35 + (1.2 * YG \text{ (bu/acre)})$ Tables 7b. CSU Bulletin #568A
Sorghum Silage	<input checked="" type="checkbox"/> CSUCE Published Fertilizer Suggestions <input type="checkbox"/> Adjacent State CE-Published Fertilizer Suggestions <input type="checkbox"/> CNMP Method that meets USDA-NRCS standards <input type="checkbox"/> CO NRCS NMP guidelines <input type="checkbox"/> Department-approved Method	$9 * YG \text{ (tons/A)}$ Tables 7d. CSU Bulletin #568A
Sorghum Grain	<input checked="" type="checkbox"/> CSUCE Published Fertilizer Suggestions <input type="checkbox"/> Adjacent State CE-Published Fertilizer Suggestions <input type="checkbox"/> CNMP Method that meets USDA-NRCS standards <input type="checkbox"/> CO NRCS NMP guidelines <input type="checkbox"/> Department-approved Method	$1.2 * YG \text{ (lbs/A)}$ Tables 7c. CSU Bulletin #568A
Triticale Hay & Silage	<input type="checkbox"/> CSUCE Published Fertilizer Suggestions <input type="checkbox"/> Adjacent State CE-Published Fertilizer Suggestions <input type="checkbox"/> CNMP Method that meets USDA-NRCS standards <input type="checkbox"/> CO NRCS NMP guidelines <input checked="" type="checkbox"/> Department-approved Method	$\text{yield goal (lbs/a DM)} * (\% \text{ protein} / 6.25 / 100) / .66$ multiply silage yield by 0.4 to get dry matter of silage N content/efficiency use factor Where protein is not known, 9% is used KSU Bulletin MF-2227
Oat Hay & Silage	<input checked="" type="checkbox"/> CSUCE Published Fertilizer Suggestions <input type="checkbox"/> Adjacent State CE-Published Fertilizer Suggestions <input type="checkbox"/> CNMP Method that meets USDA-NRCS standards <input type="checkbox"/> CO NRCS NMP guidelines <input type="checkbox"/> Department-approved Method	$YG \text{ (tons wet)} * 2000 \text{ lb/t} * 1.6\% \text{ N} / 100$ Multiply silage yield by 0.4 to get dry matter of silage Crop removal CSU 568A.
Spring Seeded Small Grain	<input checked="" type="checkbox"/> CSUCE Published Fertilizer Suggestions <input type="checkbox"/> Adjacent State CE-Published Fertilizer Suggestions <input type="checkbox"/> CNMP Method that meets USDA-NRCS standards <input type="checkbox"/> CO NRCS NMP guidelines <input type="checkbox"/> Department-approved Method	$125 \text{ lbs N per } 100 \text{ bu/A, minus } 20 \text{ lb N/a for each } 10 \text{ bu/A difference}$ CSU Do-It-Yourself Manure Mgt Plan
Winter Wheat Grain	<input type="checkbox"/> CSUCE Published Fertilizer Suggestions <input checked="" type="checkbox"/> Adjacent State CE-Published Fertilizer Suggestions <input type="checkbox"/> CNMP Method that meets USDA-NRCS standards <input type="checkbox"/> CO NRCS NMP guidelines <input type="checkbox"/> Department-approved Method	$YG \text{ (bu/a)} * 1.75$ KSU Bulletin C-529 Wheat Production Handbook, 1997

4) NUTRIENT BUDGET INFORMATION

Cooperative Extension Nutrient Budget Information:

Crop:	Manure and Process Wastewater Application Rate Calculated Using:	Description of Method to be Used (calculation, look-up table, etc.):
Wheat Silage	<input type="checkbox"/> CSUCE Published Fertilizer Suggestions <input checked="" type="checkbox"/> Adjacent State CE-Published Fertilizer Suggestions <input type="checkbox"/> CNMP Method that meets USDA-NRCS standards <input type="checkbox"/> CO NRCS NMP guidelines <input type="checkbox"/> Department-approved Method	Convert yield to grain and fertilize as for grain KSU Bulletin MF-1072 Small Grain Cereals for Forage
Alfalfa	<input checked="" type="checkbox"/> CSUCE Published Fertilizer Suggestions <input type="checkbox"/> Adjacent State CE-Published Fertilizer Suggestions <input type="checkbox"/> CNMP Method that meets USDA-NRCS standards <input type="checkbox"/> CO NRCS NMP guidelines <input type="checkbox"/> Department-approved Method	$((YG*2000)*(\% \text{ Protein}/6.25)*(\text{soil factor}))/0.66$ Soil factor 0.5-0.7 for sandy to clay soil, respectively CSU Soil Publication #0.565 & 0.566
Sudangrass/ Sudex Hay	<input type="checkbox"/> CSUCE Published Fertilizer Suggestions <input checked="" type="checkbox"/> Adjacent State CE-Published Fertilizer Suggestions <input type="checkbox"/> CNMP Method that meets USDA-NRCS standards <input type="checkbox"/> CO NRCS NMP guidelines <input type="checkbox"/> Department-approved Method	$YG (\text{tons/a DM}) * 40 \text{ lbs N/ton}$ KSU Bulletin MF-1036
Sunflowers	<input checked="" type="checkbox"/> CSUCE Published Fertilizer Suggestions <input checked="" type="checkbox"/> Adjacent State CE-Published Fertilizer Suggestions <input type="checkbox"/> CNMP Method that meets USDA-NRCS standards <input type="checkbox"/> CO NRCS NMP guidelines <input type="checkbox"/> Department-approved Method	$YG (\text{lb/a}) * 0.065 \text{ lbs N/lb grain}$ High Plains Sunflower Production Handbook
Grass/hay	<input checked="" type="checkbox"/> CSUCE Published Fertilizer Suggestions <input type="checkbox"/> Adjacent State CE-Published Fertilizer Suggestions <input type="checkbox"/> CNMP Method that meets USDA-NRCS standards <input type="checkbox"/> CO NRCS NMP guidelines <input type="checkbox"/> Department-approved Method	$185 \text{ lbs N/ton} - 40 \text{ lbs N per ton for each ton yield goal less than a 4 ton yield goal}$ (N credit to 1' soils sample) Reference is CSU 568A.
Small grain pasture and grain	<input checked="" type="checkbox"/> CSUCE Published Fertilizer Suggestions <input type="checkbox"/> Adjacent State CE-Published Fertilizer Suggestions <input type="checkbox"/> CNMP Method that meets USDA-NRCS standards <input type="checkbox"/> CO NRCS NMP guidelines <input type="checkbox"/> Department-approved Method	$(\text{animals/acre}) \times \text{expected weight gain (lb/hd)} \times 0.4 = \text{lbs N/a}$ OR (Winter wheat recommendation plus 30-50 lbs N) Soil publication #0.565
Dry beans	<input checked="" type="checkbox"/> CSUCE Published Fertilizer Suggestions <input type="checkbox"/> Adjacent State CE-Published Fertilizer Suggestions <input type="checkbox"/> CNMP Method that meets USDA-NRCS standards <input type="checkbox"/> CO NRCS NMP guidelines <input type="checkbox"/> Department-approved Method	$YG (\text{lbs/a}) * .031/.66$ CSU published N content (3.1%N) / use efficiency factor

4) NUTRIENT BUDGET INFORMATION

Formulas for calculating nutrient budgets

- ☐ CSUCE Published Fertilizer Suggestions
- ☐ Adjacent State CE-Published Fertilizer Suggestions
- ☐ CNMP Method that meets USDA-NRCS standards
- ☐ CO NRCS NMP guidelines
- ☒ Department-approved Method

Olsen Laboratories current formulas, lbs. N/yield unit (where not otherwise specified, multiply by yield goal as presented in Appendices B and C)

Corn silage – multiply silage yield goal by 7 and use grain recommendation

Corn grain – $\frac{(0.90)(YG, \text{ bu/a})}{1-(0.0008)(YG, \text{ bu/a})} + 50 = \text{lb N/bu}$

Sorghum/Sudex silage – multiply silage yield goal by 6 and use grain recommendation

Sorghum/Sudex hay – multiply hay yield goal by 20 and use grain recommendation

Sorghum grain - $(YG)(1.2 \text{ N/bu}) + 30 \text{ lb N}$

Triticale silage – 10 lb N/ton

Triticale hay – 30 lb N/ton

Summer fallow wheat grain – 1.75 lbs N/bu

Continuous wheat grain – 2.0 lbs N/bu (includes nitrogen for stubble decomposition)

Spring wheat grain - $(YG)(2.4 \text{ lbs N/bu}) - (OM-1)*20$

Wheat silage – 10 lb/ton

Wheat hay – 30 lb N/ton

Small grain grazing – 40 lbs N/a (not dependent on yield goal)

Oat silage – 9 lbs N/ton

Oat hay – multiply hay yield goal by 17.5 and use grain recommendation

Oat grain – 1.0 lb N/bu

Irrigated grass – 45 lbs N/ton

Dryland grass – 30 lbs N/ton

Sugar beets – $(YG)(9 \text{ lbs N/ton}) - 30*\%OM - \text{Residual N} * 1.67(2' \text{ soil sample})$

Millet – 1.5 lb N/bu

Sunflower – 0.06 lb N/lb

Dry beans – $(YG, \text{ bu})(2.0 \text{ lb N/bu}) (+20 \text{ lbs N for kidney beans, } -30 \text{ lbs N if inoculated, } +30 \text{ lbs N on sandy soils})$

4) NUTRIENT BUDGET INFORMATION

Formulas for calculating nutrient budgets:

- ☐ CSUCE Published Fertilizer Suggestions
- ☐ Adjacent State CE-Published Fertilizer Suggestions
- ☐ CNMP Method that meets USDA-NRCS standards
- ☐ CO NRCS NMP guidelines
- ☒ Department-approved Method

ServiTech Laboratories current formulas, lbs. N/yield unit (multiply by yield goal as presented in Appendices B and C)

Corn silage - 10 lbs. N/Ton
Corn grain – 1.3 lb N/bu
Sorghum silage – 9 lb N/ton
Sorghum hay – 25 lb N/ton
Sorghum grain - 1.2 lb N/bu
Sudex silage – 7.5 lb N/ton
Sudex hay – 25 lb N/ton
Triticale silage – 10 lb N/ton
Wheat silage – 10 lb N/ton
Winter wheat grain – 1.75 lbs N/bu
Spring wheat grain -2.0 lbs N/bu
Small grain hay (triticale) – 26 lb N/ton
Oat silage – 12 lb N/ton
Oat hay – 25 lb N/ton
Oat grain – 1.0 lb N/bu
Pasture/Grass/Native grass – 40 lbs N/ton
Sugar beets – 7.5 lbs N/ton
Millet – 1.7 lb N/bu
Sunflower – 0.05 lb N/lb
Dry beans – 0.04 lb N/lb

4) NUTRIENT BUDGET INFORMATION

Formulas for calculating nutrient budgets:

Midwest Laboratories current formulas, lbs. N/yield unit (multiply by yield goal as presented in Appendices B and C)

Corn silage – 9.5 lbs. N/Ton

Corn grain – 1.3 lb N/bu

Sorghum silage – 7 lb N/ton

Sorghum grain - 1.3 lb N/bu

Sudex hay – 15 lb/ton

Triticale silage – convert yield to grain, use grain recommendation

Triticale grain – 1.5 lb N/bu

Winter wheat grain – 2.3 lbs N/bu

Wheat silage – convert yield to grain, use grain recommendation

Oat grain – 1.2 lb N/bu

Oat silage - convert yield to grain, use grain recommendation

Pasture/Grass/Native grass – 40 lbs N/ton

Sugar Beets – 8.5 lb N/ton

Millet – 1.6 lbs N/bu

Sunflower – 0.06 lbs N/lb

Dry beans – 0.4 lbs N/bu

Nitrogen Credits

Available Nitrogen in Wastewater (CSU Bulletin 568A, plus personal communication)

1st year N availability in wastewater, sprinkler applied ($\text{Organic N} * 30\% + (\text{NH}_4\text{-N} * 55\%)$)

1st year N availability in wastewater, flood applied ($\text{Organic N} * 30\% + (\text{NH}_4\text{-N} * 78\%)$)

2nd year N availability in wastewater ($\text{Organic N} * 10\%$)

Available Nitrogen in Manure (minimum values)

1st year N availability in manure ($\text{Organic N} * 25\% + (\text{NH}_4\text{-N} * \% \text{ available below})$)

2nd year N availability in manure ($\text{Organic N} * 10\%$)

Available Nitrogen in Compost (minimum values)

1st year N availability in manure ($\text{Organic N} * 20\% + (\text{NH}_4\text{-N} * \% \text{ available below})$)

2nd year N availability in manure ($\text{Organic N} * 10\%$)

NH₄-N % available, solid manure and slurry (UN NebGuide G1335).

Inject or immediate incorporation – 95%

Incorporate within 1 day – 50-70%

Incorporate 2-5 days – 0-50%

Incorporate >5 days – 0%

The laboratory's plant available nutrient schedule may also be used.

In the near future these mineralization factors may change, and this nutrient management plan will use the revised values from CSU. In fields which receive a similar amount of manure or wastewater each year, the 2 year mineralization rate may be added together and credited all in one year for simplicity.

Legume Credit- Previous crop, alfalfa

>80% stand	100-140 lbs N/A
60-80% stand	60-100 lbs N/A
<60% stand	30-60 lbs N/A

Alfalfa protein to be used in the absence of a forage test (CSU no. 0.565)

Maturity	% Crude Protein	% N
Pre-bud	22-24	3.5-3.8
Bud	20-22	3.2-3.5
Early bloom	17-19	2.7-3.0
Midbloom	14-16	2.2-2.6
Full bloom	<14	<2.2

Additional nitrogen needs

Crop decomposition

Up to 20 lbs/A additional nitrogen may need to be applied to carbonaceous crop residues.

Starter fertilizer

Regardless of the recommendations for nutrient application, up to 35 lbs of N and 35 lbs P_2O_5 may be added as a starter fertilizer at or just prior to planting in order to ensure nutrient availability to seedlings, promoting a more vigorous plant more capable of utilizing nutrients already in the soil. Any commercial fertilizer applied will be counted towards the total recommendation and subtracted from the gross recommendation in the N credit section ("other") of the rate determination sheet. If 35 lbs N are not required to grow the crop, this amount of starter will still be used.

Small grain grazing

Where small grains are fall grazed, additional nutrient needs based upon animal intake or a flat rate (30-50 lbs N/a) may be applied as outlined in the formulas for CSU and Olsen Lab.

In Season N adjustments

The formulas provided represent the maximum amount of N to be applied with advanced planning. It is not uncommon for nitrogen rates to be adjusted during the growing season. The following outlines procedures which may be used to make in season adjustments. Only one test will be used at any given time of plant growth to provide a recommendation. However, additional tests may be used at other stages of crop growth. For instance, it is possible that a soil test at side dressing could indicate the soil is likely to have enough nitrogen to grow a crop, but a tissue test at the reproductive phase of growth could show the plant is now deficient in nitrogen and needs more N.

Pre-Sidedress Nitrate Test (PSNT)

1 foot soil samples are analyzed for nitrate when corn is 6 to 12" tall. Guidance documents from Cooperative Extension, either from CSU or from a surrounding state, will be used to interpret results.

Tissue testing

Plant samples will be analyzed for nitrogen at the appropriate time, and from the appropriate location on the plant for the given crop. The results will be compared with expected nitrogen content for the plant at the specified growth stage. Deficiencies will be managed with additional N.

Leaf chlorophyll meters & near infrared sensors

There are a number of meters on the market which detect the amount of chlorophyll in leaves. By comparing the chlorophyll meter readings from the reference strips to those from the rest of the field, N sufficiency and the need for additional N can be determined. Pennsylvania State University's tool may be used at first side dress when the corn is at the V6-V8 growth stages (Fact Sheet 53: *The Early Season Chlorophyll Meter Test for Corn*) and Purdue University's tool may be used later in the season when the crop is at the V8-V12 growth stages through pollination (Fact Sheet: AY-317-W, *Determining Nitrogen Fertilizer Side dress Application Needs in Corn Using a Chlorophyll Meter*). Interpretation of NIR sensors will be made with the latest available data.

Visual analysis

Visual symptoms are an excellent diagnostic tool to determine nutrient limitations in crop fields. The visual characteristics displayed when plants are nutrient deficient vary by plant species and variety, stage of growth, and severity of the deficiency, and they are well documented and available as a reference from numerous Extension and industry sources. Visual symptoms of nitrogen deficiency may be used to adjust nitrogen recommendations. Many factors will be taken into account to determine the need for nitrogen, including but not limited to unusual weather conditions, previous crop history, source and amount of nitrogen already applied, crop stage of growth, soil physical properties, disease, insect, herbicide injury, and other factors related to root growth. Typically 20-40 lbs N will be recommended.

Nitrogen reference strip

Several reference strips are established through the field where more than enough nitrogen has been applied and is known to not be limiting. These strips are established for comparison to potential problem spots in the field. It is useful to have reference strips when interpreting soil tests and tissue tests. It is crucial that reference strips be established for a chlorophyll meter be calibrated for each field, previous crop, hybrid, fertilizer and/or manure application and differing soil types. If reference strips are utilized, they will be 12,000 square feet for each 60 acres of crop of each hybrid. If the reference strip is developed using commercial fertilizer, it will receive 10-25% above the recommended rate for the field (Purdue University Fact Sheet AY-317-W), and if manure is used to produce the reference strip, it will be applied at 100% above the recommended rate (Iowa State University Fact Sheet PM 2026, *Sensing Nitrogen Stress in Corn*). This latter rate is appropriate because there are many sources of variability when using manure, and the reference strip must be fully fertilized.

APPENDIX E

NUTRIENT MANAGEMENT PLAN TERMS

5) COLORADO PHOSPHORUS INDEX RISK ASSESSMENT

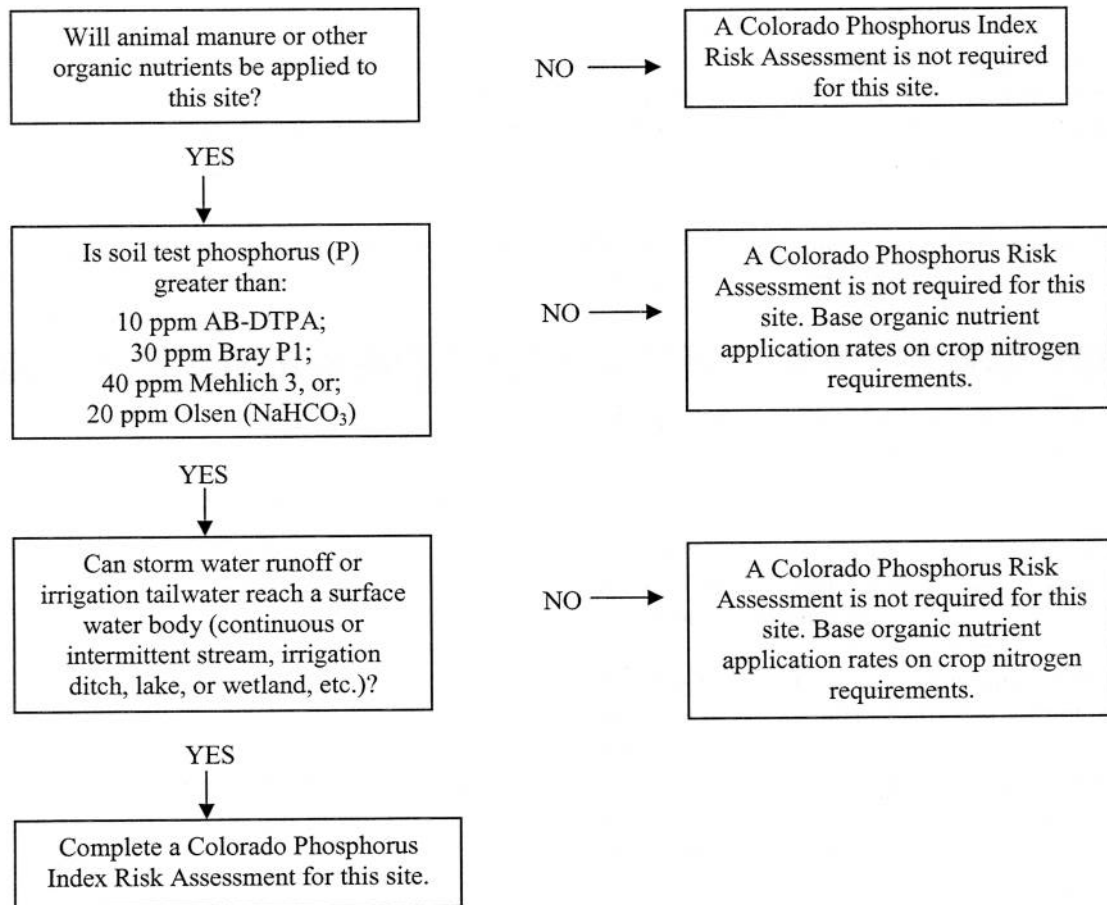
Results from the assessment are provided on the Rate Determination Sheets in Appendix E.

5) PHOSPHORUS AND NITROGEN TRANSPORT

Application rates for manure and process wastewater applied to land application sites minimize phosphorus and nitrogen transport from the application sites to surface waters. An initial assessment of the potential for phosphorus and nitrogen transport risk to surface water will be made prior to manure or process wastewater being applied to an application site. [Regulation No. 61.17(8)(b)(xii)(B)]

There is currently no published tool suitable for assessing nitrogen transport risk. Phosphorus and nitrogen transport risk will be assessed using the Colorado Phosphorus Index Risk Assessment.

The following flow chart will be used to determine if a phosphorus risk assessment must be completed for a land application site:



APPENDIX F

NUTRIENT MANAGEMENT PLAN TERMS

5) FIELD NUTRIENT BALANCE CALCULATIONS

See Rate Determination Sheets.

Manure Application - Rate Determination Sheet

Crop sequence/rotation and year					
Year	2012	2013	2014	2015	2016
Crop	Corn	Corn	Alfalfa	Alfalfa	Alfalfa

Field: Heinz
Farm: Galeton Dairy

1. Field Information:

Crop: Corn Silage Crop Year: 2012 Acres: 152
Soil name/texture: Sandy Loam through 2013 Previous Crop: Corn
Soil test results Date 10/1/2012 N(as NO₃-N), ppm 13.5 P (Olsen), ppm 59 K (NH₄OAc), ppm 333 pH 8.0
P-Index Score 11 Application rate based upon Nitrogen

2. Nutrient Needs:

	N (lb/acre)	P ₂ O ₅ (lb/a)
a) Expected yield	26.2 Tons, Lbs or Bu. / Acre	
b) Nutrient recommendations	232	0
Formula Used: 35+(7.5*YG) Tables 7a-8 CSU Bulletin # 568A		
c) Special nutrient needs above recommendations	232	0
d) Total nutrient needs	232	0

3. Nitrogen Credits:

a) Residual soil nitrate credit* (1 foot for grass, 2 feet for all others)	13.5 ppm NO ₃	49
b) Previous legume crop		
c) Previous manure application credit (applic rate x org N x % min)	0 10% avail	0
d) Other:		
e) Total nitrogen credit		49

4. Recommended Nutrient Application Rate:

a) Total nutrient need minus Total nutrient credit (lb/acre)	183	0
--	-----	---

Sample ID: Slurry Lab #: 17898

Application Method: Slurry broadcast w/o incorp

b) Expected NH ₃ -N availability	0 %
c) NH ₄ -N available from manure	3.21 lbs/Ton
d) Expected mineralization rate	40 %
e) Organic N available from manure	5.8 lbs/Ton
f) Total available N ([c x {1-b}] + [d x e])	lbs/Ton
Recommended manure application rate (a/f)	Ton/acre 79

g) P₂O₅ available 3.68 lbs/Ton Analysis 4.6 lbs/Ton lbs P₂O₅/acre 290
h) Additional P₂O₅ needs from commercial fertilizer 0 lbs/acre

P is 80% available when applied frequently, 60% available when applied infrequently (analysis P₂O₅ lbs/ton x 0.6 or 0.8 = available P₂O₅)

Predicted method, form, and timing of application: Applied via spreader truck in spring and fall

Manure Application - Rate Determination Sheet

Crop sequence/rotation and year					
Year	2012	2013	2014	2015	2016
Crop	Corn	Corn	Alfalfa	Alfalfa	Alfalfa

Field:

Heinz

Farm:

Galeton Dairy

1. Field Information:

Crop: Alfalfa Crop Year: 2014 Acres: 152
 Soil name/texture: Sandy Loam through 2016 Previous Crop: Corn Silage
 Soil test results Date: 10/1/2012 N(as NO₃-N), ppm: 13.5 P (Olsen), ppm: 59 K (NH₄OAc), ppm: 333 pH: 8.0
 P-Index Score 11 Application rate based upon Nitrogen

2. Nutrient Needs:

	N (lb/acre)	P ₂ O ₅ (lb/a)
a) Expected yield	5.3 Tons, Lbs or Bu. / Acre	
b) Nutrient recommendations	254	0
Formula Used: (((YG*2000)*(%Protein/6.25)*(0.6))/0.66) CSU Soil Publication # 0.565		
c) Special nutrient needs above recommendations	254	0
d) Total nutrient needs		

3. Nitrogen Credits:

a) Residual soil nitrate credit* (1 foot for grass, 2 feet for all others)	23.8 ppm NO ₃	49
b) Previous legume crop		
c) Previous manure application credit (applic rate x org N x % min)	458.2 10% avail	46
Previous Year LBS Organic N Applied		
d) Other:		95
e) Total nitrogen credit		

4. Recommended Nutrient Application Rate:

a) Total nutrient need minus Total nutrient credit (lb/acre)	160	0
--	-----	---

Sample ID: Slurry Lab #: 17898

Application Method: Slurry broadcast w/o incorp

b) Expected NH ₃ -N availability	0 %	
c) NH ₄ -N available from manure	3.21 lbs/Ton	
d) Expected mineralization rate	40 %	
e) Organic N available from manure	5.8 lbs/Ton	
f) Total available N ([c x {1-b}] + [d x e])	lbs/Ton	2.3
Recommended manure application rate (a/f)		69 Ton/acre

g) P ₂ O ₅ available	3.68 lbs/Ton	Analysis	4.6 lbs/Ton	lbs P ₂ O ₅ /acre	253
h) Additional P ₂ O ₅ needs from commercial fertilizer			0 lbs/acre		

P is 80% available when applied frequently, 60% available when applied infrequently (analysis P₂O₅ lbs/ton x 0.6 or 0.8 = available P₂O₅)

Predicted method, form, and timing of application: Unlikely to be applied, but if necessary via spreader truck in spring and fall

Manure Application - Rate termination Sheet

Crop sequence/rotation and year					
Year	2012	2013	2014	2015	2016
Crop	Corn	Alfalfa	Alfalfa	Alfalfa	Alfalfa

Field: Pelz
Farm: Galeton Dairy ▼

1. Field Information:

Crop: Corn Silage ▼ Crop Year: 2012 ▼ Acres: 54
Soil name/texture: Sandy Loam ▼ Previous Crop: Corn Silage ▼

Soil test results Date 9/30/2011 N(as NO₃-N), ppm 179.6 P (Olsen), ppm 128 K (NH₄OAc), ppm 682 pH 7.5

P-Index Score 11 Application rate based upon Nitrogen

2. Nutrient Needs:

		N (lb/acre)	P ₂ O ₅ (lb/a)
a) Expected yield	26.2 Tons, Lbs or Bu. / Acre		
b) Nutrient recommendations		232	0
Formula Used: 35+(7.5*YG) Tables 7a-8 CSU Bulletin # 568A			
c) Special nutrient needs above recommendations		232	0
d) Total nutrient needs			

3. Nitrogen Credits:

a) Residual soil nitrate credit* (1 foot for grass, 2 feet for all others)	179.6 ppm NO ₃	647
b) Previous legume crop		
c) Previous manure application credit (applic rate x org N x % min)		
Previous Year LBS Organic N Applied	504 10% avail	50
d) Other:		
e) Total nitrogen credit		697

4. Recommended Nutrient Application Rate:

a) Total nutrient need minus Total nutrient credit (lb/acre)

	0	0
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Sample ID: Slurry Lab #: 17898

Application Method: Slurry broadcast w/o incorp ▼

b) Expected NH ₃ -N availability	0 %	
c) NH ₄ -N available from manure	3.21 lbs/Ton	
d) Expected mineralization rate	40 %	
e) Organic N available from manure	5.8 lbs/Ton	
f) Total available N ([c x {1-b}] + [d x e])	lbs/Ton	2.3
Recommended manure application rate (a/f)		0

g) P₂O₅ available 3.68 lbs/Ton Analysis 4.6 lbs/Ton lbs P₂O₅/acre 0
h) Additional P₂O₅ needs from commercial fertilizer 0 lbs/acre

P is 80% available when applied frequently, 60% available when applied infrequently (analysis P₂O₅ lbs/ton x 0.6 or 0.8 = available P₂O₅)

Predicted method, form, and timing of application: No application this year

Manure Application - Rate termination Sheet

Crop sequence/rotation and year					
Year	2012	2013	2014	2015	2016
Crop	Corn	Alfalfa	Alfalfa	Alfalfa	Alfalfa

Field:

Pelz

Farm:

Galeton Dairy

1. Field Information:

Crop: Crop Year: Acres:
 Soil name/texture: through 2016 Previous Crop:
 Soil test results Date: 9/30/2011 N(as NO₃-N), ppm: 117.2 P (Olsen), ppm: 128 K (NH₄OAc), ppm: 682 pH: 7.5
 *assumes soil nitrate reduced by 225 lbs from previous crop
 P-Index Score: 11 Application rate based upon: Nitrogen

2. Nutrient Needs:

	N (lb/acre)	P ₂ O ₅ (lb/a)
a) Expected yield <input type="text" value="5.3"/> Tons, Lbs or Bu. / Acre		
b) Nutrient recommendations	254	0
Formula Used: (((YG*2000)*(%Protein/6.25)*(0.6))/0.66) CSU Soil Publication # 0.565		
c) Special nutrient needs above recommendations	254	0
d) Total nutrient needs	254	0

3. Nitrogen Credits:

a) Residual soil nitrate credit* (1 foot for grass, 2 feet for all others)	<input type="text" value="117.2"/> ppm NO ₃	<input type="text" value="422"/>
b) Previous legume crop		
c) Previous manure application credit (applic rate x org N x % min)	<input type="text" value="0"/> 10% avail	<input type="text" value="0"/>
	Previous Year LBS Organic N Applied	
d) Other:		
e) Total nitrogen credit		<input type="text" value="422"/>

4. Recommended Nutrient Application Rate:

a) Total nutrient need minus Total nutrient credit (lb/acre)	<input type="text" value="0"/>	<input type="text" value="0"/>
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Sample ID: Lab #:

Application Method:

b) Expected NH ₃ -N availability	<input type="text" value="0"/> %	
c) NH ₄ -N available from manure	<input type="text" value="3.21"/> lbs/Ton	
d) Expected mineralization rate	<input type="text" value="40"/> %	
e) Organic N available from manure	<input type="text" value="5.8"/> lbs/Ton	
f) Total available N ([c x {1-b}] + [d x e])	<input type="text" value="2.3"/> lbs/Ton	
Recommended manure application rate (a/f)	Ton/acre	<input type="text" value="0"/>

g) P ₂ O ₅ available	<input type="text" value="3.68"/> lbs/Ton	Analysis	<input type="text" value="4.6"/> lbs/Ton	lbs P ₂ O ₅ /acre	<input type="text" value="0"/>
h) Additional P ₂ O ₅ needs from commercial fertilizer	<input type="text" value="0"/> lbs/acre				

P is 80% available when applied frequently, 60% available when applied infrequently (analysis P₂O₅ lbs/ton x 0.6 or 0.8 = available P₂O₅)

Predicted method, form, and timing of application:



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Manure Application - Rate termination Sheet

Crop sequence/rotation and year					
Year	2012	2013	2014	2015	2016
Crop	Corn	Alfalfa	Alfalfa	Alfalfa	Alfalfa

Field:

Pelz

Farm:

Galeton Dairy

1. Field Information:

Crop: Alfalfa Crop Year: 2013 Acres: 54
 Soil name/texture: Sandy Loam through 2016 Previous Crop: Corn Silage
 Soil test results Date 9/30/2011 N(as NO₃-N), ppm 54.7 P (Olsen), ppm 128 K (NH₄OAc), ppm 682 pH 7.5
 *assumes soil nitrate reduced by 225 lbs from previous crop
 P-Index Score 11 Application rate based upon Nitrogen

2. Nutrient Needs:

	N (lb/acre)	P ₂ O ₅ (lb/a)
a) Expected yield 5.3 Tons, Lbs or Bu. / Acre		
b) Nutrient recommendations	254	0
Formula Used: (((YG*2000)*(%Protein/6.25)*(0.6))/0.66) CSU Soil Publication # 0.565		
c) Special nutrient needs above recommendations		
d) Total nutrient needs	254	0

3. Nitrogen Credits:

a) Residual soil nitrate credit* (1 foot for grass, 2 feet for all others)	54.7 ppm NO ₃	197
b) Previous legume crop		
c) Previous manure application credit (applic rate x org N x % min) Previous Year LBS Organic N Applied	0 10% avail	0
d) Other:		
e) Total nitrogen credit		197

4. Recommended Nutrient Application Rate:

a) Total nutrient need minus Total nutrient credit (lb/acre)	57	0
Sample ID: Slurry Lab #: 17898		
Application Method: Slurry broadcast w/o incorp		
b) Expected NH ₃ -N availability	0 %	
c) NH ₄ -N available from manure	3.21 lbs/Ton	
d) Expected mineralization rate	40 %	
e) Organic N available from manure	5.8 lbs/Ton	
f) Total available N [(c x {1-b}) + (d x e)]	lbs/Ton	2.3
Recommended manure application rate (a/f)	Ton/acre	25

g) P₂O₅ available 3.68 lbs/Ton Analysis 4.6 lbs/Ton lbs P₂O₅/acre 91
 h) Additional P₂O₅ needs from commercial fertilizer 0 lbs/acre

P is 80% available when applied frequently, 60% available when applied infrequently (analysis P₂O₅ lbs/ton x 0.6 or 0.8 = available P₂O₅)

Predicted method, form, and timing of application: Unlikely to be applied, but if necessary via spreader truck in spring and fall

Manure Application - Rate termination Sheet

Crop sequence/rotation and year					
Year	2012	2013	2014	2015	2016
Crop	Corn	Corn	Alfalfa	Alfalfa	Alfalfa

Field: Magnuson
Farm: Galetton Dairy

1. Field Information:

Crop: Corn Silage Crop Year: 2012 Acres: 81
Soil name/texture: Sandy Loam through 2013 Previous Crop: Corn Silage

Soil test results Date 9/30/2011 N(as NO₃-N), ppm 96.1 P (Olsen), ppm 78 K (NH₄OAc), ppm 565 pH 7.6

P-Index Score 11 Application rate based upon Nitrogen

2. Nutrient Needs:

	N (lb/acre)	P ₂ O ₅ (lb/a)
a) Expected yield 26.2 Tons, Lbs or Bu. / Acre		
b) Nutrient recommendations	232	0
Formula Used: 35+(7.5*YG) Tables 7a-8 CSU Bulletin # 568A		
c) Special nutrient needs above recommendations		
d) Total nutrient needs	232	0

3. Nitrogen Credits:

a) Residual soil nitrate credit* (1 foot for grass, 2 feet for all others)	96.1 ppm NO ₃	346
b) Previous legume crop		
c) Previous manure application credit (applic rate x org N x % min)	339 10% avail	34
d) Other:		
e) Total nitrogen credit		380

4. Recommended Nutrient Application Rate:

a) Total nutrient need minus Total nutrient credit (lb/acre)	0	0
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Sample ID: Slurry Lab #: 17898

Application Method: Slurry broadcast w/o incorp

b) Expected NH ₃ -N availability	0 %
c) NH ₄ -N available from manure	3.21 lbs/Ton
d) Expected mineralization rate	40 %
e) Organic N available from manure	5.8 lbs/Ton
f) Total available N ([c x {1-b}] + [d x e])	lbs/Ton
Recommended manure application rate (a/f)	Ton/acre 0

g) P₂O₅ available 3.68 lbs/Ton Analysis 4.6 lbs/Ton lbs P₂O₅/acre 0
h) Additional P₂O₅ needs from commercial fertilizer 0 lbs/acre

P is 80% available when applied frequently, 60% available when applied infrequently (analysis P₂O₅ lbs/ton x 0.6 or 0.8 = available P₂O₅)

Predicted method, form, and timing of application: No application this year

Manure Application - Rate termination Sheet

Crop sequence/rotation and year					
Year	2012	2013	2014	2015	2016
Crop	Corn	Corn	Alfalfa	Alfalfa	Alfalfa

Field: Magnuson
Farm: Galetton Dairy ▼

1. Field Information:

Crop: Corn Silage ▼ Crop Year: 2012 ▼ Acres: 81
Soil name/texture: Sandy Loam ▼ through 2013 Previous Crop: Corn Silage ▼

Soil test results Date 9/30/2011 N(as NO₃-N), ppm 33.6 P (Olsen), ppm 78 K (NH₄OAc), ppm 565 pH 7.6
*assumes soil nitrate reduced by 225 lbs from previous crop
P-Index Score 11 Application rate based upon Nitrogen

2. Nutrient Needs:

		N (lb/acre)	P ₂ O ₅ (lb/a)
a) Expected yield	26.2 Tons, Lbs or Bu. / Acre		
b) Nutrient recommendations		232	0
Formula Used: 35+(7.5*YG)			
Tables 7a-8 CSU Bulletin # 568A			
c) Special nutrient needs above recommendations			
d) Total nutrient needs		232	0

3. Nitrogen Credits:

a) Residual soil nitrate credit* (1 foot for grass, 2 feet for all others) 33.6 ppm NO₃ 121
b) Previous legume crop
c) Previous manure application credit (applic rate x org N x % min)
||Previous Year LBS Organic N Applied 10% avail 0
d) Other:
e) Total nitrogen credit 121

4. Recommended Nutrient Application Rate:

a) Total nutrient need minus Total nutrient credit (lb/acre) 111 0

Sample ID: Slurry Lab #: 17898

Application Method: Slurry broadcast w/o incorp ▼

b) Expected NH₃-N availability 0 %
c) NH₄-N available from manure 3.21 lbs/Ton
d) Expected mineralization rate 40 %
e) Organic N available from manure 5.8 lbs/Ton
f) Total available N ([c x {1-b}] + [d x e]) lbs/Ton 2.3
Recommended manure application rate (a/f) Ton/acre 48

g) P₂O₅ available 3.68 lbs/Ton Analysis 4.6 lbs/Ton lbs P₂O₅/acre 175
h) Additional P₂O₅ needs from commercial fertilizer 0 lbs/acre

P is 80% available when applied frequently, 60% available when applied infrequently (analysis P₂O₅ lbs/ton x 0.6 or 0.8 = available P₂O₅)

Predicted method, form, and timing of application: Applied via spreader truck in spring and fall

Manure Application - Rate termination Sheet

Crop sequence/rotation and year					
Year	2012	2013	2014	2015	2016
Crop	Corn	Corn	Alfalfa	Alfalfa	Alfalfa

Field: Magnuson
Farm: Galetton Dairy ▼

1. Field Information:

Crop: Alfalfa ▼ Crop Year: 2014 ▼ Acres:
Soil name/texture: Sandy Loam ▼ through 2016 Previous Crop: Corn Silage ▼

Soil test results Date 9/30/2011 N(as NO₃-N), ppm 33.6 P (Olsen), ppm 78 K (NH₄OAc), ppm 565 pH 7.6
*assumes soil nitrate reduced by 225 lbs from 2012 crop
P-Index Score 11 Application rate based upon Nitrogen

2. Nutrient Needs:

	N (lb/acre)	P ₂ O ₅ (lb/a)
a) Expected yield 5.3 Tons, Lbs or Bu. / Acre		
b) Nutrient recommendations	254	0
Formula Used: (((YG*2000)*(%Protein/6.25)*(0.6))/0.66) CSU Soil Publication # 0.565		
c) Special nutrient needs above recommendations	254	0
d) Total nutrient needs	254	0

3. Nitrogen Credits:

a) Residual soil nitrate credit* (1 foot for grass, 2 feet for all others)	33.6 ppm NO ₃	121
b) Previous legume crop		
c) Previous manure application credit (applic rate x org N x % min) Previous Year LBS Organic N Applied	365 10% avail	37
d) Other:		
e) Total nitrogen credit		157

4. Recommended Nutrient Application Rate:

a) Total nutrient need minus Total nutrient credit (lb/acre)	97	0
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Sample ID: Slurry Lab #: 17898

Application Method: Slurry broadcast w/o incorp ▼

b) Expected NH ₃ -N availability	0 %
c) NH ₄ -N available from manure	3.21 lbs/Ton
d) Expected mineralization rate	40 %
e) Organic N available from manure	5.8 lbs/Ton
f) Total available N ([c x {1-b}] + [d x e])	lbs/Ton
Recommended manure application rate (a/f)	Ton/acre 42

g) P ₂ O ₅ available 3.68 lbs/Ton	Analysis 4.6 lbs/Ton	lbs P ₂ O ₅ /acre 154
h) Additional P ₂ O ₅ needs from commercial fertilizer	0 lbs/acre	

P is 80% available when applied frequently, 60% available when applied infrequently (analysis P₂O₅ lbs/ton x 0.6 or 0.8 = available P₂O₅)

Predicted method, form, and timing of application: Unlikely to be applied, but if necessary via spreader truck in spring and fall

Manure Application - Rate termination Sheet

Crop sequence/rotation and year					
Year	2012	2013	2014	2015	2016
Crop	Corn	Corn	Corn	Corn	Corn

Field: East Flood
Farm: Galeton Dairy ▼

1. Field Information:

Crop: Corn Silage ▼ Crop Year: 2012 ▼ Acres: 22
Soil name/texture: Clay Loam ▼ Previous Crop: Corn Silage ▼

Soil test results Date 11/9/2011 N(as NO₃-N), ppm 174.4 P (Olsen), ppm 111 K (NH₄OAc), ppm 681 pH 7.8

P-Index Score 11 Application rate based upon Nitrogen

2. Nutrient Needs:

		N (lb/acre)	P ₂ O ₅ (lb/a)
a) Expected yield	26.2 Tons, Lbs or Bu. / Acre		
b) Nutrient recommendations		232	0
Formula Used:	35+(7.5*YG) Tables 7a-8 CSU Bulletin # 568A		
c) Special nutrient needs above recommendations		232	0
d) Total nutrient needs			

3. Nitrogen Credits:

a) Residual soil nitrate credit* (1 foot for grass, 2 feet for all others) 174.4 ppm NO₃ 628
b) Previous legume crop
c) Previous manure application credit (applic rate x org N x % min)
Previous Year LBS Organic N Applied 0 10% avail 0
d) Other:
e) Total nitrogen credit 628

4. Recommended Nutrient Application Rate:

a) Total nutrient need minus Total nutrient credit (lb/acre) 0 0

Sample ID: Slurry Lab #: 17898

Application Method: Slurry broadcast w/o incorp ▼

b) Expected NH₃-N availability 0 %
c) NH₄-N available from manure 3.21 lbs/Ton
d) Expected mineralization rate 40 %
e) Organic N available from manure 5.8 lbs/Ton
f) Total available N ([c x {1-b}] + [d x e]) lbs/Ton 2.3
Recommended manure application rate (a/f) Ton/acre 0

g) P₂O₅ available 3.68 lbs/Ton Analysis 4.6 lbs/Ton lbs P₂O₅/acre 0
h) Additional P₂O₅ needs from commercial fertilizer 0 lbs/acre

P is 80% available when applied frequently, 60% available when applied infrequently (analysis P₂O₅ lbs/ton x 0.6 or 0.8 = available P₂O₅)

Predicted method, form, and timing of application: No application this year

Manure Application - Rate Determination Sheet

Crop sequence/rotation and year					
Year	2012	2013	2014	2015	2016
Crop	Corn	Corn	Corn	Corn	Corn

Field: East Flood
Farm: Galeton Dairy

1. Field Information:

Crop: Corn Silage Crop Year: 2013 Acres: 22
Soil name/texture: Clay Loam Previous Crop: Corn Silage

Soil test results Date 11/9/2011 N(as NO₃-N), ppm 112 P (Olsen), ppm 111 K (NH₄OAc), ppm 681 pH 7.8
*assumes soil nitrate reduced by 225 lbs from previous crop
P-Index Score 11 Application rate based upon Nitrogen

2. Nutrient Needs:

		N (lb/acre)	P ₂ O ₅ (lb/a)
a) Expected yield	26.2 Tons, Lbs or Bu. / Acre		
b) Nutrient recommendations		232	0
Formula Used: 35+(7.5*YG)			
Tables 7a-8 CSU Bulletin # 568A			
c) Special nutrient needs above recommendations			
d) Total nutrient needs		232	0

3. Nitrogen Credits:

a) Residual soil nitrate credit* (1 foot for grass, 2 feet for all others) 112 ppm NO₃ 403
b) Previous legume crop
c) Previous manure application credit (applic rate x org N x % min)
||Previous Year LBS Organic N Applied 0 10% avail 0
d) Other:
e) Total nitrogen credit 403

4. Recommended Nutrient Application Rate:

a) Total nutrient need minus Total nutrient credit (lb/acre) 0 0

Sample ID: Slurry Lab #: 17898

Application Method: Slurry broadcast w/o incorp

b) Expected NH ₃ -N availability	0 %	
c) NH ₄ -N available from manure	3.21 lbs/Ton	
d) Expected mineralization rate	40 %	
e) Organic N available from manure	5.8 lbs/Ton	
f) Total available N [(c x {1-b})] + [d x e]	lbs/Ton	2.3
Recommended manure application rate (a/f)		0

g) P₂O₅ available 3.68 lbs/Ton Analysis 4.6 lbs/Ton lbs P₂O₅/acre 0
h) Additional P₂O₅ needs from commercial fertilizer 0 lbs/acre

P is 80% available when applied frequently, 60% available when applied infrequently (analysis P₂O₅ lbs/ton x 0.6 or 0.8 = available P₂O₅)

Predicted method, form, and timing of application: No application this year

Manure Application - Rate Determination Sheet

Crop sequence/rotation and year					
Year	2012	2013	2014	2015	2016
Crop	Corn	Corn	Corn	Corn	Corn

Field: East Flood
Farm: Galeton Dairy

1. Field Information:

Crop: Corn Silage Crop Year: 2014 Acres: 22
Soil name/texture: Clay Loam through 2016 Previous Crop: Corn Silage

Soil test results Date 11/9/2011 N(as NO₃-N), ppm 49.4 P (Olsen), ppm 111 K (NH₄OAc), ppm 681 pH 7.8
*assumes soil nitrate reduced by 225 lbs from previous crop
P-Index Score 11 Application rate based upon Nitrogen

2. Nutrient Needs:

		N (lb/acre)	P ₂ O ₅ (lb/a)
a) Expected yield	26.2 Tons, Lbs or Bu. / Acre		
b) Nutrient recommendations		232	0
Formula Used: 35+(7.5*YG)			
Tables 7a-8 CSU Bulletin # 568A			
c) Special nutrient needs above recommendations			
d) Total nutrient needs		232	0

3. Nitrogen Credits:

a) Residual soil nitrate credit* (1 foot for grass, 2 feet for all others)	49.4 ppm NO ₃	178
b) Previous legume crop		
c) Previous manure application credit (applic rate x org N x % min)		
Previous Year LBS Organic N Applied	0 10% avail	0
d) Other:		
e) Total nitrogen credit		178

4. Recommended Nutrient Application Rate:

a) Total nutrient need minus Total nutrient credit (lb/acre)	54	0
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Sample ID: Slurry Lab #: 17898

Application Method: Slurry broadcast w/o incorp

b) Expected NH ₃ -N availability	0 %	
c) NH ₄ -N available from manure	3.21 lbs/Ton	
d) Expected mineralization rate	40 %	
e) Organic N available from manure	5.8 lbs/Ton	
f) Total available N ([c x {1-b}] + [d x e])	lbs/Ton	2.3
Recommended manure application rate (a/f)		23
	Ton/acre	

g) P₂O₅ available 3.68 lbs/Ton Analysis 4.6 lbs/Ton lbs P₂O₅/acre 85
h) Additional P₂O₅ needs from commercial fertilizer 0 lbs/acre

P is 80% available when applied frequently, 60% available when applied infrequently (analysis P₂O₅ lbs/ton x 0.6 or 0.8 = available P₂O₅)

Predicted method, form, and timing of application: Applied via spreader truck in spring and incorporated within two weeks

Manure Application - Rate termination Sheet

Crop sequence/rotation and year					
Year	2012	2013	2014	2015	2016
Crop	Corn	Alfalfa	Alfalfa	Alfalfa	Alfalfa

Field: Bruner East
Farm: Galeton Dairy ▼

1. Field Information:

Crop: Corn Silage ▼ Crop Year: 2012 ▼ Acres: 65
Soil name/texture: Sandy Loam ▼ Previous Crop: Corn Silage ▼

Soil test results Date 11/9/2011 N(as NO₃-N), ppm 35.1 P (Olsen), ppm 69 K (NH₄OAc), ppm 365 pH 7.9

P-Index Score 11 Application rate based upon Nitrogen

2. Nutrient Needs:

		N (lb/acre)	P ₂ O ₅ (lb/a)
a) Expected yield	26.2 Tons, Lbs or Bu. / Acre		
b) Nutrient recommendations		232	0
Formula Used: 35+(7.5*YG) Tables 7a-8 CSU Bulletin # 568A			
c) Special nutrient needs above recommendations			
d) Total nutrient needs		232	0

3. Nitrogen Credits:

a) Residual soil nitrate credit* (1 foot for grass, 2 feet for all others)	35.1 ppm NO ₃	126
b) Previous legume crop		
c) Previous manure application credit (applic rate x org N x % min)		
Previous Year LBS Organic N Applied	0 10% avail	0
d) Other:		
e) Total nitrogen credit		126

4. Recommended Nutrient Application Rate:

a) Total nutrient need minus Total nutrient credit (lb/acre)	105	0
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Sample ID: Slurry Lab #: 17898

Application Method: Slurry broadcast w/o incorp ▼

b) Expected NH ₃ -N availability	0 %	
c) NH ₄ -N available from manure	3.21 lbs/Ton	
d) Expected mineralization rate	40 %	
e) Organic N available from manure	5.8 lbs/Ton	
f) Total available N [(c x {1-b}) + [d x e]]	lbs/Ton	2.3
Recommended manure application rate (a/f)		45 Ton/acre

g) P₂O₅ available 3.68 lbs/Ton Analysis 4.6 lbs/Ton lbs P₂O₅/acre 167
h) Additional P₂O₅ needs from commercial fertilizer 0 lbs/acre

P is 80% available when applied frequently, 60% available when applied infrequently (analysis P₂O₅ lbs/ton x 0.6 or 0.8 = available P₂O₅)

Predicted method, form, and timing of application: Unlikely to be applied, but if necessary via spreader truck in spring and fall

Manure Application - Rate termination Sheet

Crop sequence/rotation and year					
Year	2012	2013	2014	2015	2016
Crop	Corn	Alfalfa	Alfalfa	Alfalfa	Alfalfa

Field: Bruner East
Farm: Galeton Dairy

1. Field Information:

Crop: Alfalfa Crop Year: 2013 Acres: 65
Soil name/texture: Sandy Loam through 2016 Previous Crop: Corn Silage

Soil test results Date 11/9/2011 N(as NO₃-N), ppm 35.1 P (Olsen), ppm 69 K (NH₄OAc), ppm 365 pH 7.9

P-Index Score 11 Application rate based upon Nitrogen

2. Nutrient Needs:

	N (lb/acre)	P ₂ O ₅ (lb/a)
a) Expected yield 5.3 Tons, Lbs or Bu. / Acre		
b) Nutrient recommendations	254	0
Formula Used: (((YG*2000)*(%Protein/6.25)*(0.6))/0.66) CSU Soil Publication # 0.565		
c) Special nutrient needs above recommendations		
d) Total nutrient needs	254	0

3. Nitrogen Credits:

a) Residual soil nitrate credit* (1 foot for grass, 2 feet for all others)	35.1 ppm NO ₃	126
b) Previous legume crop		
c) Previous manure application credit (applic rate x org N x % min)		
Previous Year LBS Organic N Applied	423 10% avail	42
d) Other:		
e) Total nitrogen credit		169

4. Recommended Nutrient Application Rate:

a) Total nutrient need minus Total nutrient credit (lb/acre)	86	0
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Sample ID: Slurry Lab #: 17898

Application Method: Slurry broadcast w/o incorp

b) Expected NH ₃ -N availability	0 %
c) NH ₄ -N available from manure	3.21 lbs/Ton
d) Expected mineralization rate	40 %
e) Organic N available from manure	5.8 lbs/Ton
f) Total available N ([c x {1-b}] + [d x e])	lbs/Ton

Recommended manure application rate (a/f) Ton/acre 37

g) P ₂ O ₅ available	3.68 lbs/Ton	Analysis	4.6 lbs/Ton	lbs P ₂ O ₅ /acre	136
h) Additional P ₂ O ₅ needs from commercial fertilizer	0 lbs/acre				

P is 80% available when applied frequently, 60% available when applied infrequently (analysis P₂O₅ lbs/ton x 0.6 or 0.8 = available P₂O₅)

Predicted method, form, and timing of application: Unlikely to be applied, but if necessary via spreader truck in spring and fall

Wastewater Application - Site Determination Sheet

Crop sequence/rotation and year					
Year	2012	2013	2014	2015	2016
Crop	Corn	Corn	Corn	Corn	Corn

Field: East Flood
Farm: Galetton Dairy

1. Field Information:

Crop: Corn Silage Crop Year: 2012 Acres: 22
Soil name/texture: Clay Loam Previous Crop: Alfalfa

Soil test results Date 11/9/2011 N(as NO₃-N), ppm 174.4 P (Olsen), ppm 111 K (NH₄OAc), ppm 681 pH 7.8

P-Index Score 11 Application rate based upon Nitrogen

2. Nutrient Needs:

	N (lb/acre)	P2O5 (lb/a)
a) Expected yield 26.2 Tons, Lbs or Bu. / Acre		
b) Nutrient recommendations	232	0
Formula Used: 35+(7.5*YG) Tables 7a-8 CSU Bulletin # 568A		
c) Special nutrient needs above recommendations	232	0
d) Total nutrient needs		

3. Nitrogen Credits:

a) Residual soil nitrate credit* (1 foot for grass, 2 feet for all others)	174.4 ppm NO ₃	628
b) Previous legume crop		
c) Previous manure application credit (applic rate x org N x % min)	0 10% avail	0
Previous Year LBS Organic N Applied		
d) Other:		
e) Total nitrogen credit		628

4. Recommended Nutrient Application Rate:

a) Total nutrient need minus Total nutrient credit (lb/acre)	0	0
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Sample ID: Pond 6 Lab #: 17902

Application method: Flood

b) Expected NH ₃ -N availability	78 %	
c) NH ₄ -N available from manure	0.17 lbs/1000 gal	
d) Expected mineralization rate	30 %	
e) Organic N available from manure	2.17 lbs/1000 gal	
f) Total available N ([c x {1-b}] + [d x e])	lbs/1000 gal	0.8
Recommended manure application rate (a/f)		0
		0.0

g) P2O5 available 1.50 lbs/1000 gal Analysis 1.87 lbs/1000 gal lbs P2O5/acre 0
h) Additional P2O5 needs from commercial fertilizer 0 lbs/acre

P is 80% available when applied frequently, 60% available when applied infrequently (analysis P2O5 lbs/ton x 0.6 or 0.8 = available P2O5)

Predicted method, form, and timing of application: No application this year

Wastewater Application - Site Determination Sheet

Crop sequence/rotation and year					
Year	2012	2013	2014	2015	2016
Crop	Alfalfa	Corn	Corn	Corn	Corn

Field: Ley
Farm: Galeton Dairy ▼

1. Field Information:

Crop: Alfalfa ▼ Crop Year: 2012 ▼ Acres: 115
Soil name/texture: Sandy Loam ▼ Previous Crop: Alfalfa ▼

Soil test results Date 11/9/2011 N(as NO₃-N), ppm 24.8 P (Olsen), ppm 81 K (NH₄OAc), ppm 670 pH 8.6
P-Index Score 10 Application rate based upon Nitrogen

2. Nutrient Needs:

a) Expected yield 5.3 Tons, Lbs or Bu. / Acre N (lb/acre) 254
b) Nutrient recommendations P2O5 (lb/a) 0
Formula Used: (((YG*2000)*(%Protein/6.25)*(0.6))/0.66)
CSU Soil Publication # 0.565
c) Special nutrient needs above recommendations
d) Total nutrient needs

3. Nitrogen Credits:

a) Residual soil nitrate credit* (1 foot for grass, 2 feet for all others) 24.8 ppm NO₃ 89
b) Previous legume crop
c) Previous manure application credit (applic rate x org N x % min)
||Previous Year LBS Organic N Applied 100 10% avail 10
d) Other:
e) Total nitrogen credit 99

4. Recommended Nutrient Application Rate:

a) Total nutrient need minus Total nutrient credit (lb/acre) 155 0

Sample ID: Pond 6 Lab #: 17902

Application method: Sprinkler ▼

b) Expected NH₃-N availability 55 %
c) NH₄-N available from manure 0.17 lbs/1000 gal
d) Expected mineralization rate 30 %
e) Organic N available from manure 2.17 lbs/1000 gal
f) Total available N ([c x {1-b}] + [d x e]) 0.7
Recommended manure application rate (a/f) Gal/acre 208,355
ac-in/acre 7.6

g) P2O5 available 1.50 lbs/1000 gal Analysis 1.87 lbs/1000 gal lbs P2O5/acre 312
h) Additional P2O5 needs from commercial fertilizer 0 lbs/acre

P is 80% available when applied frequently, 60% available when applied infrequently (analysis P2O5 lbs/ton x 0.6 or 0.8 = available P2O5)

Predicted method, form, and timing of application: Applied via pivot in spring, summer and fall

Wastewater Application Rate Determination Sheet

Crop sequence/rotation and year					
Year	2012	2013	2014	2015	2016
Crop	Alfalfa	Corn	Corn	Corn	Corn

Field: Ley
Farm: Galeton Dairy ▼

1. Field Information:

Crop: Corn Silage ▼ Crop Year: 2013 ▼ Acres: 115
Soil name/texture: Sandy Loam ▼ Previous Crop: Alfalfa ▼

Soil test results Date 11/9/2011 N(as NO₃-N), ppm 24.8 P (Olsen), ppm 81 K (NH₄OAc), ppm 670 pH 8.6

P-Index Score 10 Application rate based upon Nitrogen

2. Nutrient Needs:

	N (lb/acre)	P2O5 (lb/a)
a) Expected yield 26.2 Tons, Lbs or Bu. / Acre		
b) Nutrient recommendations	232	
Formula Used: 35+(7.5*YG) Tables 7a-8 CSU Bulletin # 568A		
c) Special nutrient needs above recommendations		
d) Total nutrient needs	232	0

3. Nitrogen Credits:

a) Residual soil nitrate credit* (1 foot for grass, 2 feet for all others)	24.8 ppm NO ₃	89
b) Previous legume crop		60
c) Previous manure application credit (applic rate x org N x % min) Previous Year LBS Organic N Applied	452 10% avail	45
d) Other:		
e) Total nitrogen credit		194

4. Recommended Nutrient Application Rate:

a) Total nutrient need minus Total nutrient credit (lb/acre)	37	0
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Sample ID: Pond 6 Lab #: 17902

Application method: Sprinkler ▼

b) Expected NH ₃ -N availability	55 %	
c) NH ₄ -N available from manure	0.17 lbs/1000 gal	
d) Expected mineralization rate	30 %	
e) Organic N available from manure	2.17 lbs/1000 gal	
f) Total available N ([c x {1-b}] + [d x e])	lbs/1000 gal	0.7
Recommended manure application rate (a/f)		Gal/acre 49,725
		ac-in/acre 1.8

g) P2O5 available 1.50 lbs/1000 gal Analysis 1.87 lbs/1000 gal lbs P2O5/acre 74
h) Additional P2O5 needs from commercial fertilizer 0 lbs/acre

P is 80% available when applied frequently, 60% available when applied infrequently (analysis P2O5 lbs/ton x 0.6 or 0.8 = available P2O5)

Predicted method, form, and timing of application: Applied via pivot in spring, summer and fall

Wastewater Application - Site Determination Sheet

Crop sequence/rotation and year					
Year	2012	2013	2014	2015	2016
Crop	Alfalfa	Corn	Corn	Corn	Corn

Field:

Ley

Farm:

Galeton Dairy

1. Field Information:

Crop: Crop Year: Acres:
 Soil name/texture: through 2016 Previous Crop:
 Soil test results Date: N(as NO₃-N), ppm: P (Olsen), ppm: K (NH₄OAc), ppm: pH:
 P-Index Score: Application rate based upon:

2. Nutrient Needs:

	N (lb/acre)	P2O5 (lb/a)
a) Expected yield <input type="text" value="26.2"/> Tons, Lbs or Bu. / Acre		
b) Nutrient recommendations	<input type="text" value="232"/>	
Formula Used: <input type="text" value="35+(7.5*YG)"/> Tables 7a-8 CSU Bulletin # 568A		
c) Special nutrient needs above recommendations	<input type="text" value="232"/>	<input type="text" value="0"/>
d) Total nutrient needs	<input type="text" value="232"/>	<input type="text" value="0"/>

3. Nitrogen Credits:

a) Residual soil nitrate credit* (1 foot for grass, 2 feet for all others)	<input type="text" value="24.8"/> ppm NO ₃	<input type="text" value="89"/>
b) Previous legume crop		
c) Previous manure application credit (applic rate x org N x % min) Previous Year LBS Organic N Applied	<input type="text" value="108"/> 10% avail	<input type="text" value="11"/>
d) Other:		
e) Total nitrogen credit		<input type="text" value="100"/>

4. Recommended Nutrient Application Rate:

a) Total nutrient need minus Total nutrient credit (lb/acre)	<input type="text" value="131"/>	<input type="text" value="0"/>
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Sample ID: Lab #:

Application method:

b) Expected NH ₃ -N availability	<input type="text" value="55"/> %	
c) NH ₄ -N available from manure	<input type="text" value="0.17"/> lbs/1000 gal	
d) Expected mineralization rate	<input type="text" value="30"/> %	
e) Organic N available from manure	<input type="text" value="2.17"/> lbs/1000 gal	
f) Total available N ([c x {1-b}] + [d x e])	<input type="text" value="0.7"/> lbs/1000 gal	
Recommended manure application rate (a/f)		<input type="text" value="176,521"/>
		<input type="text" value="6.4"/>

g) P2O5 available	<input type="text" value="1.50"/> lbs/1000 gal	Analysis	<input type="text" value="1.87"/> lbs/1000 gal	lbs P2O5/acre	<input type="text" value="264"/>
h) Additional P2O5 needs from commercial fertilizer	<input type="text" value="0"/> lbs/acre				

P is 80% available when applied frequently, 60% available when applied infrequently (analysis P2O5 lbs/ton x 0.6 or 0.8 = available P2O5)

Predicted method, form, and timing of application: